

Claims

1. A medicament dispenser for use in the delivery of a combination medicament product to a patient, the dispenser comprising
  - 5 a first medicament container for containing a first medicament component;
  - a first release means for releasing the contents of said first medicament container;
  - 10 at least one further medicament container for containing at least one further medicament component; and
  - at least one further release means for releasing the contents of each said at least one further medicament container;
- 15 wherein the first medicament component is kept separate from the at least one further medicament component until the point of release thereof for delivery in combination, and wherein the dispenser additionally comprises
- 20 an electronic control system for controlling the release of contents from the first and at least one further medicament container.
2. A medicament dispenser according to claim 1, wherein the first medicament component and the at least one further medicament component are non-identical.
- 25 3. A medicament dispenser according to either of claims 1 or 2, comprising the first medicament container and only one further medicament container.
4. A medicament dispenser according to any of claims 1 to 3, wherein said first release means and said at least one further release means are independently operable.

5. A medicament dispenser according to any of claims 1 to 3, wherein said first release means and said at least one further release means are operable in coupled fashion.
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6. A medicament dispenser according to any of claims 1 to 5, wherein any or either of the first and the at least one further medicament containers are provided to the medicament dispenser as reversibly removable refills.
- 10 7. A medicament dispenser according to any of claims 1 to 6, wherein the electronic control system includes input means for inputting control commands thereto.
- 15 8. A medicament dispenser according to any of claims 1 to 7, wherein the electronic control system includes a diagnostic system for collecting diagnostic information relating to patient disease condition.
9. A medicament dispenser according to claim 8, wherein the electronic control system and diagnostic system are integral.
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10. A medicament dispenser according to claim 8, wherein the diagnostic system is separate from the medicament dispenser and communication means are provided to enable communication of data between the diagnostic system and the electronic control system.
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11. A medicament dispenser system according to any of claims 1 to 10, additionally comprising an electronic data management system integral with or in communication with the electronic control system.
- 30 12. A medicament dispenser according to claim 11, wherein the electronic data management system comprises a memory for storage of data; a microprocessor for

performing operations on said data; and a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data.

13. A medicament dispenser according to either of claims 11 or 12, wherein the  
5 electronic data management system additionally comprises a data input system for user input of data to the electronic data management system.

14. A medicament dispenser according to any of claims 11 to 13, additionally comprising a visual display unit for display of data from the electronic data  
10 management system to the patient.

15. A medicament dispenser according to any of claims 11 to 14, additionally comprising a datalink for linking to a local data store to enable communication of data between the local data store and the electronic data management system.

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16. A medicament dispenser according to any of claims 1 to 15, wherein the first medicament container and / or the at least one further medicament container comprise a reservoir and a meter for metering medicament from said reservoir.

20 17. A medicament dispenser according to claim 16, wherein the meter comprises at least one metering cavity or chamber.

18. A medicament dispenser according to claim 17, wherein the or each metering chamber is reversibly moveable into fluid communication with the reservoir for  
25 metering therefrom.

19. A medicament dispenser according to any of claims 1 to 18, additionally comprising mixing means for mixing the released medicament components prior to their delivery to the patient as a combination product.

20. A medicament dispenser according to claim 19, wherein the mixing means comprises a mixing chamber including inlets for receiving medicament from the first medicament container and at least one further medicament container; and an outlet for delivery of combination medicament product for delivery to the patient.

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21. A medicament dispenser according to any of claims 1 to 20, additionally comprising variable release means responsive to the electronic control system for varying the amount of medicament product releasable from each medicament container.

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22. A medicament dispenser according to claim 21, wherein the variable release means includes an timing control system for controlling the time of release of contents from the first and at least one further medicament container.

15 23. A medicament dispenser according to any of claims 1 to 22, additionally comprising an actuation indicator associated with the first medicament container and / or the at least one further medicament container.

24. A medicament dispenser according to claim 23, wherein said actuation 20 indicator comprises an actuation sensor sensitive to a parameter selected from the group consisting of electro magnetic radiation, magnetic field, light, motion, temperature, pressure, sound, oxygen concentration, carbon dioxide concentration and moisture.

25 25. A medicament dispenser according to any of claims 1 to 24, wherein the medicament dispenser is in the form of an inhaler device.

26. A medicament dispenser according to claim 25, wherein the inhaler device is in the form of a device selected from the group consisting of a reservoir dry powder 30 inhaler (RDPI), a multi-dose dry powder inhaler (MDPI), a metered dose inhaler (MDI), a liquid spray inhaler (LSI) and any hybrids thereof.

27. A medicament dispenser according to either of claims 25 or 26 comprising a single outlet for delivery of the combination medicament product to the respiratory tract of a patient.

28. A medicament dispenser according to any of claims 25 to 27, actuatable in response to an inward breath of a patient.

10 29. A medicament dispenser according to claim 28 including a breath sensor for detecting said inward breath wherein the breath sensor communicates with the electronic control system.

15 30. A medicament dispenser according to claim 29, wherein the breath sensor comprises a breath-movable element that is movable in response to the inward breath of a patient.

20 31. A medicament dispenser according to claim 29, wherein the breath sensor is selected from the group consisting of a pressure sensor for sensing the pressure profile associated with the inward breath of a patient, an airflow sensor for sensing the airflow profile associated with the inward breath of a patient, a temperature sensor for sensing the temperature profile associated with the inward breath of a patient, a moisture sensor for sensing the moisture profile associated with the inward breath of a patient, a gas sensor for sensing the oxygen or carbon dioxide profile associated with the inward breath of a patient and any mixtures thereof.

25 32. A medicament dispenser according to any one of claims 1 to 31, wherein the first medicament container contains a first medicament component and the at least one further medicament container contains at least one further medicament component.

33. A medicament dispenser according to claim 32, wherein said first medicament component comprises a bronchodilator and said at least one further medicament component comprises an anti-inflammatory.

5 34. A medicament dispenser according to claim 33, wherein said bronchodilator is a beta-agonist and said anti-inflammatory is a steroid.

35. A medicament dispenser according to claim 34, wherein said bronchodilator is selected from the group consisting of salbutamol, salmeterol, formoterol and any 10 salts or solvates thereof and mixtures thereof.

36. A medicament dispenser according to either of claims 34 or 35, wherein said anti-inflammatory is selected from the group consisting of a beclomethasone ester, fluticasone ester, budesonide and any salt or solvates thereof and mixtures thereof.

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37. Use of a medicament dispenser according to any of claims 1 to 36 for dispensing a combination medicament product.